

**WHAT IS CLAIMED IS:**

1. A method of fabricating a cartilage implant comprising:  
embedding chondrocytes or mesenchymal stem cells in a three-dimensional substrate,  
the substrate containing randomly rewound  $\alpha$ -helical monomers of type I collagen; and  
growing the chondrocytes or mesenchymal stem cells in the substrate;  
thereby producing a cartilage implant.
2. The method of claim 1, wherein the substrate further contains randomly rewound  $\alpha$ -helical monomers of type II collagen.
3. The method of claim 2, wherein the type II collagen is partially digested.
4. The method of claim 3, wherein the type I collagen is partially digested.
5. The method of claim 2, wherein the type I collagen is partially digested.
6. The method of claim 2, wherein the chondrocytes or mesenchymal stem cells, the type I collagen, and the type II collagen are prepared from two or three different animal sources.
7. The method of claim 2, wherein the chondrocytes or mesenchymal stem cells and the substrate are placed in a rotating and oscillating vessel.
8. The method of claim 1, wherein the type I collagen is partially digested.
9. The method of claim 1, wherein the chondrocytes or mesenchymal stem cells and the type I collagen are each prepared from a different animal source.
10. The method of claim 1, wherein the chondrocytes or mesenchymal stem cells and the substrate are placed in a rotating and oscillating vessel.

11. A method of fabricating a cartilage implant comprising:  
embedding chondrocytes in a three-dimensional substrate, the substrate containing  
randomly rewound  $\alpha$ -helical monomers of type I collagen; and  
growing the chondrocytes in the substrate;  
thereby producing a cartilage implant.

12. The method of claim 11, wherein the substrate further contains randomly  
rewound  $\alpha$ -helical monomers of type II collagen.

13. The method of claim 12, wherein the type II collagen is partially digested.

14. The method of claim 13, wherein the type I collagen is partially digested.

15. The method of claim 12, wherein the type I collagen is partially digested.

16. A cartilage implant comprising:  
chondrocytes; and  
a three-dimensional matrix, the matrix containing randomly rewound  $\alpha$ -helical  
monomers of type I collagen;  
wherein the chondrocytes are embedded in the matrix.

17. The cartilage implant of claim 16, wherein the matrix further contains randomly  
rewound  $\alpha$ -helical monomers of type II collagen.

18. The cartilage implant of claim 17, wherein the type II collagen is partially  
digested.

19. The cartilage implant of claim 18, wherein the type I collagen is partially  
digested.

1           20.    The cartilage implant of claim 17, wherein the type I collagen is partially  
2 digested.  
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1           21.    The cartilage implant of claim 17, wherein the chondrocytes, the type I collagen,  
2 and the type II collagen are prepared from two or three different animal sources.  
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1           22.    The cartilage implant of claim 16, wherein the type I collagen is partially  
2 digested.  
3

1           23.    The cartilage implant of claim 22, wherein the chondrocytes and the type I  
2 collagen are each prepared from a different animal source.  
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1           24.    The cartilage implant of claim 16, wherein the chondrocytes and the type I  
2 collagen are each prepared from a different animal source.